

AMERICAN FARMER.

RURAL ECONOMY, INTERNAL IMPROVEMENTS, PRICE CURRENT.

"*O fortunatos nimium sua si bona norint*
"Agricolas." Vnde

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AGRICULTURE.

A New Theory of Agriculture, in which the nature of Soils, Crops and Manures is explained; many prevailing prejudices are exploded; and the application of Bones, Gypsum, Lime, Chalk &c. is determined on scientific principles, by W. GRISENTHWAITE.

(Concluded from No. X. page 75.)

CHAPTER IV.

ON SPECIFIC

Vegetable Substances.

Specific Manures.—Perpetuation of Crops, &c.

The subject of this chapter, which I am now about to discuss, has never yet been regarded by practical men, with any reference to the improvement, and guidance of agricultural operations, and yet it will be found to be one of the greatest importance; one upon which the success of those operations depends, and with which, therefore, he must be well acquainted before he can expect either the most abundant, or constant returns.

Agriculture may be considered to be a system of operations calculated to convert manure into vegetable matter. We have seen that the land, or soil, performs the part of an instrument in the process. That all the care in its preparation is only directed to assist the action of the manure; that water is a mere medium for conveying it as nourishment to plants, and that heat facilitates their action upon it.

This view of the business of agriculture will open to us many objects which have hitherto escaped observation, because the nature of such business has never been properly understood.—What is done spontaneously, and without any co-operation of man, is called natural—what is done by his exertions, is called artificial, as if the same laws did not govern both. This has been a great impediment in the progress of science. It has repressed enquiry, by pronouncing it to be vain; and exertion by declaring its inefficiency.

Until within these few years the elements of bodies had not been discovered. The nature of compounds was but little investigated, and the transmutation of matter, if not openly acknowledged, was only tacitly denied. The sun of chemistry has at length arisen above our horizon, and has dispersed much of the darkness of former ages, and shed an illuminating ray over the various phenomena of nature.—Elements as the term implies, cannot be changed into each other. They admit of no alteration but as regards magnitude, and figure—Hence when one substance composed of certain elements is designed to be transmuted into any

other substance: as sugar, by fermentation, into alcohol, or acetic acid; or manure into grain, it is obvious, that the elements of the second must necessarily be contained in the first, for if they be not, the transmutation cannot take place.—This will render it evident that a knowledge of the elements, or constituents of bodies, which are intended to be changed into each other by certain processes, should be previously possessed in order that the processes may be conducted with a probability of success. We are therefore led to enquire into the nature of certain crops, and to consider, whether their peculiar elements be provided for, in the manure as it is now prepared by agriculturists. If they be not, it is but reasonable to infer, that the failure of many crops may be referred to the deficiency of certain elements in the manure.

If all crops were composed of the same elements, this discrimination would not be needed—and upon such a supposition the practices of husbandry have been uniformly conducted, and are now conducted; with what disadvantage will appear in the course of this chapter.

To illustrate the preceding reasoning, the wheat crop may be selected with considerable advantage, as it is that which is not only the most important to the interests of mankind, but because the presence of particular substances in it are better known, and more generally acknowledged. If we examine the straw of wheat, we shall find it composed of what may be considered common vegetable matter, or matter composed of oxygen, hydrogen, and carbon, with a small quantity of carbonate of lime—so, also, if we examine the constituents of the grain, we shall find them distinguished into starch, and gluten; and if we carry our researches still further, we shall find that the elements of the starch are precisely the same with the elements of common vegetable matters but the elements of the gluten will be found analogous to those of animals; or in addition to oxygen, hydrogen, and carbon, there will be found nitrogen. The production of this nitrogen as has been already observed, cannot be effected by mere common vegetable matter, and, therefore, the manure employed in the production of the straw and starch, could not produce the gluten also. This is a fact which has never, I believe, been attended to, either by writers on the theory, or men engaged in the practice of Agriculture. If the presence of

gluten were accidental, or the value of the flour did not depend on it, then little care need be taken to provide for its formation; but as it is required to be constantly present, and the value of the flour does essentially depend on it, therefore a provision ought to be made for it. In quantity it is not inconsiderable, but composes nearly one third part of the grain. That the operations of husbandry, as regard wheat, should be conducted without any reference to

this peculiar substance, is very remarkable.—That the failure of crops has never been ascribed to its deficiency, is still more wonderful.—What has been advanced concerning manure in general, may afford some explanation of the cause of this neglect. The process of vegetation, and the constituents of vegetables, are not known to the practical farmer, because they have been difficult to ascertain: and the nature of his manure is involved in the same obscurity. He supposes it to contain every thing needed for every crop.

That the gluten of wheat flour may always be present, it is necessary that a quantity of animal substance should exist in the manure applied to the land, where the wheat crop is intended to be raised. That a certain portion of such animal substance is applied, is proved from the fact of gluten being always found to exist in that grain—but, it is highly probable, that the quantity is not always sufficient; and if not sufficient, the crop will be defective either in quality or quantity. If we pursue our investigations a step farther than we have done, we shall discover that phosphate of lime is as constant a constituent of wheat flour as gluten itself. Phosphate of lime, therefore, is as much needed for the production of a crop of wheat as the substances which supply the starch and gluten. It is not a little remarkable that this phosphate of lime, is soluble in no known fluid, except thru' the medium of an animal substance, as gelatine, &c. and consequently the same animal substances which furnish the elements of the gluten, will also furnish a medium for the phosphate of lime; which appears to be equally indispensable to the formation of a perfect grain of wheat. It not only furnishes a medium, but generally a quantity of the phosphate itself.

The only substance now employed for the production of gluten, is the urine of stock—the alvine excrementitious matter having been proved to contain little or no nitrogen—this urine is applied either by folding, or mixed with the farm yard manure—in both of which situations, it is constantly forming ammonia, which is dissipated: so that a very inconsiderable part of the whole is retained to answer the purposes of vegetation. I have already alluded to the practice adopted in Flanders, of saving it, and have no doubt that the same practice will soon become general in this country.

When the utmost attention is paid to prevent the loss of any of the animal substances, accidentally present in farm yard manure, it still remains a question, whether there be a sufficiency for the purposes to which it is to be applied. That there is not always a sufficiency of some kinds of manure is obvious from the immense quantities of oil-cake which are employed as manure. Oil-cake, although a very excellent substance for such a purpose, can fur-

nish little else than nourishment to the straw, and starch of the wheat crop. It cannot contribute to the formation of gluten; and gluten, as has been observed, composes one third part of all that is valuable in the whole crop. This important particular therefore should certainly be ascertained. That enquiry has found a deficiency in animal matters may be inferred from the application of bones &c.

I shall now proceed to consider a point in practical husbandry at once new and interesting. It is that of the specific, peculiar use of animal matter to the wheat crop; a peculiarity with which agriculturists have been so little acquainted, that bones &c. have been highly recommended for grass, or pasture lands. To discover the injudiciousness of applying such substances to crops indiscriminately, it will be necessary to become acquainted with the fact, that there is no kind of grain except wheat, raised artificially for the purposes of man, or cattle, that contains any notable quantity of any substance analogous to that of animals.— Hence when bones &c. are used on grass lands, or for the barley crop &c. all the nitrogen, with so much hydrogen, and probably carbonic acid gas, as is sufficient to form a subcarbonate of ammonia, will be entirely lost. If bones be the animal matter employed, every one hundred pounds weight will yield about fifty pounds of solid gelatine, of which twenty pounds, at least, will be thus wasted, or two fifths of all that is valuable in the bone. If instead of being employed for grass &c. they had been used for wheat, all this might probably have been saved. This is not mere opinion—its truth is obvious to every one conversant with the chemical nature of bones and grass.

I have mentioned already, that phosphate of lime composes a part of the grain of wheat, and that phosphate of lime is supplied by animal substances. Bones furnish an abundance of it. That this constituent of the wheat crop, as well as several other constituents of different crops, should not be disregarded altogether, although they form very minute proportions of those crops, must appear reasonable to every one who knows, that, in their selections, there is exercised a constant discrimination. That wheat always takes up phosphate of lime is a proof scarcely needing further evidence, that it answers some useful, and perhaps indispensable purpose in the grain. It does not exist in the straw; and barley, or oats, or clover, grown on the same land, at the same time with the wheat, take up no portion of it whatever.

If there had not existed this constancy in the selection of particular substances—if phosphate of lime had sometimes been taken up by barley, or clover; and sulphate of lime had been found in wheat; then we might have concluded, that the whole was accidental, and being accidental, that they assisted in no way whatever the formation of other parts of grain, nor contributed to promote the general economy of the vegetable. They who are unwilling to admit the performance of certain uses by these substances, must depart from a mode of reasoning which philosophy has long countenanced, and which we must hereafter employ, whenever we are anxious to explore the causes of physical effects.

As little attention has hitherto been paid to these saline bodies as they regard the process of vegetation, and much less as they respect the operations of husbandry, I have, for the sake of distinction, called them specific manures; and the gluten of wheat, a specific vegetable matter. Hereafter, when a more complete analysis of vegetables shall be made, it is probable, that a nomenclature, founded on these specific substances, may, at least, classify, if not particularize, every kind of plant.

If we turn our attention from the wheat to the barley crop, we shall find fresh evidence to confirm the opinion of specific saline substances being present in particular plants. In the latter of these grains, instead of phosphate of lime, there is always found a small quantity of either nitrate of soda, or nitrate of potassa (salt-petre) whence we may conclude, that those salts should be present in the soil where barley is to be grown. Whether they be or not, the farmer, at present, is entirely ignorant. These salts, though spontaneously produced by nature in many situations, still require the presence of certain substances for their production—several of which it is as improbable should be accidentally furnished, as the salt itself.

It has been objected, that if this salt be found ever so necessary to the barley crop, yet its expensiveness will preclude the possibility of its being used. This is erroneous. Although salt-petre, if required in large quantities as a manure, would be too expensive, yet in the quantity actually wanted, its price is an object of little consideration. The simple process of steeping the seed in a solution of it, would probably, be sufficient—for which purpose a few pounds would suffice for an acre of land.

What has been just advanced concerning the necessity of particular saline bodies to the wheat and barley crops, may be further extended to other crops, and thus add fresh evidence to support the conclusions already drawn.

It is well known, that bean straw always yields, on incineration, a large quantity of subcarbonate of potash; but whether the subcarbonate exist in the straw, or be formed by the decomposition of a sulphate, or other salts of potassa, has never been determined. To determine which of these is present in the entire vegetable, would be to furnish information concerning the means of rendering that crop more uniformly successful than it now is. Can prejudice so far operate on the mind as to make it discountenance the belief, that some particular salt is possessed of certain properties capable of assisting the growth of the bean? If it can, then the same prejudice may reject the belief that soda is necessary to the bile, and sulphur to the hair, and iron to the blood of animals. The quantities are alike minute, and their presence probably alike indispensable.—A deficiency of these in animals would be followed by disease, and, perhaps, death; and, most likely, the same consequences would attend the want of particular saline bodies in plants.

In the pea crop has been discovered a considerable quantity of superoxalate of lime, and thus, as we pursue our researches, we still find discrimination keeping an equal pace. The

phosphate of lime, nor the nitrate of soda or potassa, has a universal use pertaining to it. They are needed for particular vegetables, but however they may promote the growth of wheat or barley, can afford no assistance to the pea. The pea demands the superoxalate of lime.

As the oxalic acid is seldom found in large quantities in a state of nature, so as to be applied as a manure, it is probable that the pea plant has the power of forming it. This is rendered still more probable from the circumstance that the oxalic acid is composed of the same elements as common vegetable matter, namely, oxygen, hydrogen, and carbon. It may, perhaps, be urged, that similar formations may take place in other salts, and thus render the attention of the agriculturist to these objects altogether unnecessary. But such a conclusion will not be warranted by this example. We every where find a sufficiency of the elements of vegetables; and to vary the proportions of those elements is to compose a class of bodies very comprehensive in their nature.—All vegetables and vegetable products, amongst which are gums, resins, starch, &c. together with the changes which they are liable to undergo, are included under them. But

what have been called mineral acids, are products of a peculiar kind, and from the strong affinity subsisting between their elements, are seldom found in those elements. It is even a rare instance that the acids are discovered uncombined with other bodies. Sulphur is not often found, except in the neighbourhood of volcanoes; and phosphorus was never found in a natural state. It could not even continue to exist were it actually produced, if exposed to the atmosphere. These observations will, therefore, completely remove all doubt respecting the necessary, previous existence of the mineral acids, and the salts composed of them and bases, as they are commonly detected in vegetables. They must convince us of the necessity of supplying plants with them ready formed—or with their elements, where a spontaneous generation of them can be effected.

Having shown that in the principal grain crops which interest the agriculturist, there exists a particular saline substance, peculiar to each, so, if we turn our attention to the grasses, and turnips, we shall still find the same discrimination.

San-sin, clover, and lucern, have long been known to contain a notable quantity of gypsum (sulphate of lime); but such knowledge, very strange to relate, never led to the adoption of gypsum as a manure, for those crops, any more than that of phosphate of lime for wheat, or nitrate of soda, or potassa for barley. It is true that gypsum has been long, and in various places, recommended as a manure, but its uses not being understood, it was recommended without any reference to crop, or indeed to the accomplishment of any fixed object. It has been highly extolled in America, but for what purposes, and upon what principle, does not appear to be explained. It has been applied to crops of every description, and if it were used with any view whatever, it was that of improving, what is vulgarly understood, by the soil. In this indefinite manner it was recommended at Holkham,

at the sheep-shearing of 1818, and, in consequence of that recommendation, it was put upon land where wheat was to be grown, as well as that where san-suin, clover &c. were to be produced. It was considered as a calcareous substance; and, even lately, doubts of its advantages on soils containing much calcareous matter, have been entertained.

These vague, and unscientific notions I endeavoured to correct at the sheep-shearing of 1818, and afterwards, in a communication to the Farmers' Journal. Thus, although I was not the first to recommend the use of gypsum; for its use had been recommended more than half a century prior to the sheep-shearing of 1818, still I believe, its particular application, had never before been accurately defined. That this statement is correct, will appear evident from the following extracts from my communication to the Farmers' Journal, dated September the 20th, 1818. Alluding to its recommendation at Holkham, I observed, that "it was considered as a general meliorator of the soil, without any reference to the particular crops to be raised on it. It was regarded as a substance merely calculated to alter the texture of the land, an effect which I would call mechanical, to contradistinguish it from that of manure, which is really physical. That it might be useful in particular situations when employed with such an intention, there can be no doubt; but its uses would not be greater than those of common chalk, and not nearly so permanent, on account of its solubility. Being considered in this point of view, it is very likely, that, under a variety of circumstances, a variety of results would be observed, and it would meet with approval, or reprobation, according as the object of the agriculturist, who employed it, was promoted, or defeated. Had its nature been well understood, and its uses been known in the economy of particular plants, it would, *a priori* have been evident when it would, probably, have led to beneficial results, and when it would, as probably, have answered no good purpose. Neither *wheat*, nor *barley*, nor *oats* &c. would derive any advantage from its use, as it forms no necessary constituent of those grains, but clover, lucern &c. would in the luxuriance of their crops, have borne ample testimony in its behalf. These plants require gypsum for healthy vegetation, for the assimilation of manures to their own peculiar nature, or the developement of some of their distinctive characters." That this view of the use of gypsum was not then, nor for some time afterwards understood, I shall prove by quoting a passage from a letter to the editor of the Farmers' Journal, published several weeks later than the extract already given. Speaking of the uses of gypsum as recommended at Holkham, he says "I am sorry to remark, that all the information I have since been able to collect, goes to repress the hopes which were at that time indulged."

The evident advantages resulting from its use are such, as will, no doubt, bring that substance into general request. It is somewhat remarkable, that, in Flanders, a kind of ashes is employed with great success as manure for the clover crop; and which by analysis, have

been found to contain about twelve per cent of gypsum.

It has been said that calcined gypsum loses all the efficient properties which belonged to it before it is calcined, but such is entirely a mistake: if by calcination is understood a mere exposure to heat, however great. If it be previously mixed with carbonaceous matter, and then calcined, it will undergo a partial decomposition, and form a sulphuret of lime; or, if the heat be sufficiently intense, and long continued, a caustic lime will be obtained, possessed of the same properties as caustic lime produced from the common limestone.

The mention of sulphuret of lime will serve, with much propriety, to introduce the subject of the turnip crop. If we examine a turnip chemically, we shall always find a considerable quantity of a hydrosulphuret, or a hydroguretted sulphuret, substances not discoverable in any of the crops heretofore considered, and, therefore, constituting the specific saline substance of the turnip. Its production has never been regarded, and consequently its explanation has not been attempted. Sulphur is known to exist in albuemen; and albu-men exists in almost all animal fluids; and, in a coagulated state, in most of the solids; at least hair, the nails, &c. contain a very great quantity of it. From the former, it is probable, is furnished all which is found in the manure of the Agriculturist. Lately the practice of paring salt marshes, and burning the sod, has been much recommended as providing a quantity of excellent manure for the turnip crop. It is not difficult to explain the manner in which such manure accomplishes such beneficial effects.—The sod of marshes which is occasionally covered by the sea, is impregnated with a variety of salts, amongst which are some sulphates: probably of lime and soda. These, by combustion, are converted into sulphurets; and sulphurets when brought into contact with water, evolve sulphuretted hydrogen gas, the very substance which I have observed to be constantly present in turnips; and whose presence, according to the reasoning hitherto pursued, is probably necessary for the successful growth of that vegetable.

The uncertainty of obtaining the requisite quantity of sulphuret, by this process, renders it desirable that some one more determinate should be found, and such is immediately offered us in the sulphate of lime, (gypsum). If gypsum, as has been stated, be mixed with carbon, (common coals will answer,) and be then exposed to a considerable heat, the sulphuric acid of the sulphate will be decomposed, and a sulphuret be formed, which may then be ground, and applied as a top dressing to the turnip crop, where it will, most probably, effect greater advantages, than are now produced by the ashes of sea marshes.

It may be necessary to caution those who may be disposed to try the efficacy of this substance, against carrying the process of calcination too far, which would completely defeat the purpose intended. In order to ascertain whether it have, or have not been carried too far, a small quantity of the sulphuret obtained, may be dissolved in a glass of water, and a few drops

of any acid may be added to it. If the decomposition has been well conducted, the addition of the acid will extricate a considerable quantity of sulphuretted hydrogen gas, which may be readily recognized by its fetid smell; it resembling that of the Harrowgate water.

Thus then has been established the existence of specific saline substances in a great variety of crops; all of which are particularly interesting to the practical Agriculturist. It would be needless to recapitulate the evidence which has been advanced to prove the essential services performed by those substances. They who doubt the utility of the general and constant operations of nature; who can attach to obvious discrimination, nothing of design, will continue sceptical in spite of proofs however demonstrative. It is highly probable, that if our enquiries were directed to other vegetables, that we should discover the same discrimination. I do not mean that every particular kind of plant would be found to possess a peculiar kind of saline substance. It is probable that there are classes of plants which are benefitted by the same salt. The acquisition of such knowledge would not only gratify the curious, but be extremely useful to the practical farmer.

The information derived from the preceding facts, leads to a conclusion which is of the highest importance as well as of the greatest novelty; namely, the perpetuation of any one crop on the same land, for any number of successive seasons. The reason why a change of cropping has been generally adopted, certainly did not arise out of any *a priori* anticipations of the mind, that the land would tire of one kind of grain. There would exist nothing apparent to justify such a conclusion; it must, therefore, have resulted from experience. *Virgil* has said "*mutatis requiescent factibus arva*" and in another passage, what is nearly to the same effect,

*Hic segetes, illic veniunt felicius uvoe:
Arbores fatus alibi, atque injussa virescant
Gramma.*"

It is probable that this change of cropping is rendered necessary from the exhaustion of those specific, saline substances which existed in the soil in sufficient quantity for one or p, but not for more. Can any other reason be assigned, why a piece of land which this year has grown a particular grain, should not be able to grow the same grain next year, and so on, without any alteration in the grain, or deficiency in the crop, more than may be occasioned by the variation of seasons? None. If a piece of land which has just produced a crop of wheat, could have restored to it all that the wheat crop has abstracted from it, there can be no doubt, but that the land would grow as good a crop of wheat the next season, as it did the former.—Why should it not? Its condition and capabilities, are the same. To ascribe choice and discrimination to land, is to trifl with our understanding. Why then has experience shown the superiority of changing the kind of grain, over that of continuing to crop the same land with the same kind.

To this it may be answered, that whilst the business of Agriculture was conducted independently of principle, there was no other, and

certainly no better guide, than experience.—Hence the failure of crops, when repeated too often in succession, suggested the expediency of change. And a change being found to succeed, it became a maxim to guide the operation of the Farmer, who has continued to respect it to the present hour. Let us consider the cause of failure. Suppose wheat had been the grain the farmer had wished to perpetuate on a piece of land, we know, from what has already been advanced, that wheat requires a large quantity of animal manure, and a certain quantity of phosphate of lime; but, it is probable, that after one crop had been raised on such land, almost all the animal manure, and phosphate of lime would be consumed, so that the next crop would have no source, or not a sufficient one, for the production of its gluten; and, consequently, for one third of the crop, there would be no provision. Can there now remain any doubt of the cause that prevents a repetition of the same grain? Had the elements of gluten, and the phosphate of lime, taken up by the former crop, been restored to the land, there is no question but that the wheat crop would have succeeded the second year, as well as the first.—This would also be the case with barley, clover, san-foin, &c. No one will dare to dispute the variety of these conclusions, who has seen the effects of gypsum at Holkham; and what is true of one, is by a parity of reasoning true of all.

As I have once been misunderstood to imply, that this capability of perpetuating one crop, must necessarily lead to the exclusive growth of one kind of grain, I shall here observe, that such a conclusion by no means follows the reasonings here employed. One piece of land might, and probably with great convenience, if not advantage, would be confined to one crop; but such a crop need not monopolize all the land. It is true that a perfect acquaintance with these specific substances, might enable the farmer to raise more frequently particular crops than hitherto he has been accustomed to do.

CHAP. V.

On Lime—Soot—Carbonic acid gas—Light, &c.

There are some substances employed as manure, or that are spontaneously provided by nature, which contribute to the operations of vegetation, by preparing other substances for that purpose, or decomposing them in such a manner, as to render them efficient. This is the case with lime, soot, carbonic acid gas and light, no one of which it is probable, could furnish any nutriment to plants, until it has undergone some change, or entered into some previous combination. And of these there are two, namely, lime, and light, which appear confined in their operation to that of rendering other substances, otherwise inert, useful as nutriment.

Lime has frequently been commended as manure, so restorative of productiveness, that, in some situations, it is supposed to excel every other; but it may safely be affirmed, that it never acted as a manure. It forms no part of any plant yet discovered. Its beneficial effects are entirely referable to its action upon the insolu-

ble, animal and vegetable matters, already contained in soils, and which are perfectly useless, before they are brought into a soluble condition. Such a change is produced by lime. *Boullion la Grange* says, that gelatine oxygenized becomes insoluble, and vegetable extractive we know becomes so from the same cause; now lime has the property of attracting oxygen, and, consequently, of restoring the property of solubility to those substances which have been deprived of it, from a combination with oxygen. Hence the use of lime on peat lands, and on all soils containing an excess of vegetable insoluble matter.

These uses of lime will clearly explain the difference between it and chalk. Chalk having no power of acting upon animal or vegetable substances, and being no other way serviceable to land than as it alters its texture.

When lime is employed upon land where there is present any quantity of animal matter, it occasions the evolution of a quantity of ammonia, which may, perhaps, be imbibed by the leaves of plants, and afterwards undergo some change so as to form gluten, &c. &c.

The agency of light in the phenomena of nature, is perhaps, as great, and almost as general as that of heat. In vegetation it promotes the growth of plants by a peculiar process; it gives them colour, aroma, inflammability, &c. But it is the first of these considerations only that I intend to notice in this place.

The atmospheric air besides its oxygen and nitrogen, contains also a quantity of carbonic acid gas, which though inconsiderable in small volumes of air, is still an object of great importance, when the immensity, and perpetual motion of the air are regarded. That large quantities may be abstracted from it, is sufficiently proved in the neutralization of caustic alkalies, and alkaline earths.

The leaves of plants are furnished with means of imbibing carbonic acid gas, and, probably, other kinds of air also. When the former is presented to them whilst they are exposed to the action of the direct rays of the sun, it is decomposed, the carbon is retained, and the oxygen, its other constituent is set free.

In this manner almost all the nourishment which forests derive for their support, is obtained. Hence the slowness with which woody fibre is formed in oak, and other trees. Why should they be left unprovided with manure, and yet be expected to flourish as well as annual crops of grain, which demand so much of the care and assistance of the Agriculturist? Nothing can be more unreasonable, than to put a young plant into the ground, and to expect it shall grow without nourishment. But unreasonable as it is, the fact proves that growth does take place, but it is so tardy, that our surprise is increased, that no means have been employed to accelerate it. What man has neglected to do, nature has to a certain degree performed.—

The young plant puts forth its leaves, and imbibes carbonic acid gas from the air. That substance furnishes it with carbon. The leaves formed in spring and summer, are shed in autumn, and manure the soil for a succeeding spring, and thus, after a succession of seasons, there has been decomposed enough carbonic

acid gas to produce a large oak, out of a small sapling. If instead of trusting to the bounty of the air, manure had been applied to the soil every year, where the oak grew, there can be no doubt, but that the same tree would have been formed in one third part of the former time.—To employ such means to promote the growth of useful forest trees might be an object of national importance.

Soot, the next substance mentioned, is composed of carbon, muriate of ammonia, extractive, iron, & carbonate of lime. Several parcels which I have examined have contained more than one third of carbonate lime, a substance which, as it is not volatile, must have been mechanically carried up the chimney with the smoke.

As a manure, the extractive is the only part which it contains that is immediately useful, there being no substances in soils capable of liberating the ammonia. The addition of caustic lime accomplishes such an effect with great rapidity, and when used with that intention, which it sometimes may with advantage, it should be by a top dressing, care being taken to do it when the land is wet, or there is probability of rain.

The manner in which the carbon acts is not yet understood. Its insolubility renders it useless before it enters into some new combination. According to the opinions of chemists, carbon will not combine with oxygen at a temperature lower than 800 Fahrenheit, but, from several experiments that I have made, I am induced to believe, that carbon combines with oxygen at perhaps every temperature, when in a state of extremely minute division. The rapidity of combination appears to observe a very irregular law, somewhat analogous to the evaporating power of water, at temperatures near the boiling point. If this property do really belong to carbon, we have no difficulty in understanding the manner in which it acts as a manure, but if we deny the existence of this property, I cannot see in what way it can be serviceable.

I have now completed the object which I had in view in this brief publication. I have endeavoured to introduce a more precise mode of considering the nature of soils and operations of manures; the specific properties of vegetables, and the necessity of attending to such properties in practical husbandry. Should this imperfect essay induce some other person to prosecute the subject further; should it illustrate any fact now obscure, or in any way whatever benefit the interests of the country in general, or the agriculturist in particular, I shall feel myself fully rewarded for the occasional hours that I have devoted to this most important subject.

LAW OF TRESPASS.

Copy of a letter addressed by John Law, Esq. to N. Young, Esq., and by him laid before the Agricultural Society of Prince George's County.

[COMMUNICATED FOR THE AMERICAN FARMER.]

DEAR SIR—When you lately consulted me on the subject of the trespass that had been committed by two of your neighbors on your land, you suggested in the course of our conversation the advantages that would result from a summary exposition of the law, on the nature and extent of the redress which has been provided for landholders, whose lands have been tres-

passed on by cattle, and whose fences have been pulled down and taken away with a criminal intent. In pursuance of this suggestion, I have devoted a few leisure moments in collecting the provisions of our laws on these subjects, and I submit to you the result of my research and inquiry, with the hope that it may in some, though in a very limited degree realize your wishes.

Nothing can be more obvious, since the right of private property has been established for the promotion or industry by enabling every individual to reap the rewards of his labor, than that this right should as far as possible be protected from every encroachment by clear and effectual regulations. It is equally obvious that nothing would be more conducive to agriculture, than just enactments by legislative authority, founded on the maxim, *Sic utere tuo ut alienum non laeda.** But, from an examination of the principles of law relating to the subject of our conversation, you will find how indefinite and unsatisfactory are its provisions on many points; and it will probably strike you, how much less vexatious it is for a landholder in most instances to let trespasses pass unpunished, than to seek redress in the modes that have been provided for him.

It is true that our law considers every entry upon another's lands, (unless by the owner's leave, or in some very particular cases) as an injury or wrong; for satisfaction of which, an action of trespass will lie. But the quantum of that satisfaction is to be determined by considering how far the offence was wilful or inadvertent, and by estimating the value of the actual damage sustained: for every man's land is in the eye of the law enclosed, and set apart from his neighbor's, and that either by a visible and material fence, as one field is divided from another by a hedge—or by an ideal invisible boundary existing only in the contemplation of law, as when one man's land adjoins to another in the same field. And every such entry or breach of a man's close, carries along with it some damage or other, for if no other special loss can be assigned, yet still the words of the writ itself specify one general damage, viz: the treading down and abusing his herbage. Such is the law as laid down by Blackstone, and it has been recognized to be law in this state. It was decided in the last term of Prince George's County Court, in the case of Prather vs. Baldwin, where the alleged trespass was committed after warning against it from the plaintiff on a field which had for years been unenclosed; and a verdict under the direction of the court, was given for the plaintiff.

But the action of trespass is a very insufficient remedy, where the trespasser is actuated by a criminal intent, or where his poverty is such that a judgment against him would be of no value. On the other hand every plaintiff in bringing his action subjects himself in the progress of it to many inconveniences, and to the probability of loss by his liability to pay costs, and fees in the first instance, and the possible insolvency of the defendant at last; considerations which frequently ensure impunity to the trespasser, and harden him to the repetition of similar offences.

There is no reason why several species of trespass should not be regarded in Maryland as criminal offences, punishable by indictment. It is laid down in the English law books, that the throwing down of enclosures is an offence punishable by antient laws and statutes—that throwing down enclosures in the night shall be punished with treble damages, and that taking down gates, poles, posts, stiles or hedgewood, or destroying them is also severely punishable, not only in the King's Court, but in the court baron. In Maryland however we have fortunately no courts baron, one of the aristocratical relics of the feudal system—and as to the jurisdiction of the courts over those offences—it has never been transferred to our Maryland courts, because it appears to be founded on particular statutes relating to the enclosing of commons and waste lands, which have been reported by Judge Kilty, "not to be applicable to the local and other circumstances of the people of Maryland"—I am

therefore of opinion on one of the points which you suggested for consideration, that the throwing down of enclosures, whatever might be the motive of the trespasser, would be regarded in our courts as a civil injury not punishable by indictment.

And here I will advert to a rule in criminal law, which though in force at this day seems to be established, on no just principles, viz: that larceny can not be committed of chattels real, or such chattels as are annexed to the freehold, unless in cases provided for by statute, for at common law it is merely a trespass and not a felony to take such things. Accordingly no larceny can be committed of trees, grass, hedges, stones, fence rails or the like.—But when once they are severed from the freehold either by the owner or the thief himself, if there be an interval between his severing and taking them away, (so that the severing and taking cannot be considered as one continued act) it would then be felony to take them. Thus of wood cut, grass in cocks, stones dug out of a quarry, larceny may be committed. By this singular distinction the greater offence, as for instance pulling down and continuously taking away fence rails, is only a civil injury—while the less offence of taking away a fence rail, not attached to the fence, but lying on the ground is punishable by indictment as a larceny.

The evils resulting from this general rule, the application of which has produced the acquittal of many a culprit, have in a great measure been remedied in England by several statutory exceptions, as for instance by making it felony to pluck up, destroy, take or carry away any roots, shrubs or plants out of nurseries, gardens or other cultivated grounds—to cut down bark, or destroy timber trees; to steal lead, iron bars and other metals from buildings, &c. But these statutes are not in force in Maryland, and I am not aware that any similar acts have been passed by the legislature, to limit the generality of the rule. It remains for their wisdom to determine whether some provisions ought not to be enacted on these subjects for the protection of agriculture within this state, and the necessity of some legislative provision seems to be apparent when it is considered that those who commit such trespasses with the intent to steal, or to support themselves or their cattle at their neighbor's expense, may in their poverty exclaim with the poet:

. Wealthy men
Who have estates to lose, whose conscious thoughts
Are full of inward guilt, may shake with dread
To have their actions sifted, or appear
Before the judge: but we that have no fleece
On which the talons of the grasping law
Can sure take hold, may safely smile on all
That can be urged against us.

If against trespassers of this description judgment and damages are rendered in a suit at law, they have a ready mode of relief by taking the benefit of the insolvent law; and if they afterwards retire into another state, the inconvenience of further prosecution will almost always protect their future acquisitions of property. Is it not therefore necessary that all trespasses with intent to steal, or for the sake of lucre or profit, should be rendered criminal offences punishable with fine, and imprisonment till the fine is paid?

Besides the action of trespass, the law has provided another redress to the party injured by authorizing him to restrain cattle, or other things found on his land encumbering it, or otherwise doing damage there; which is called a distress of things damage feasant. But a very slight reflection on the provisions of the law on this head, will show how insufficient they are as means of redress in the abstract, and how unsatisfactory in application and practice. Any damage done to the pasture or herbage of the land, or by destroying plants or trees, will authorize a distress; or where any thing is improperly placed on another's soil, it is not necessary that it should actually do an injury to the soil or its produce—it is enough if it unlawfully encumbers it. So if a man put cattle into my pasture for a week, and I give him notice that I will keep them no longer, and he will

not fetch them away, I may then restrain them as damage feasant.

Nothing which is capable of being damage feasant, can be exempted from distress, unless it be in immediate use, as a horse on which a man is riding, or a net in his hand; for to restrain them, might probably lead to a breach of the peace. But the distress must be confined to the very thing which is damage feasant, for one thing cannot be restrained for the damage done by another. If ten head of cattle be damage feasant, the owner of the soil cannot restrain one of them for the damage done by all, but only the damage done by itself. Also, cattle can only be restrained for the damage done at one time on the land: so that if beasts trespass on the land on one day, and then go off before they can be restrained, and trespass on it the next day, and then are taken, they cannot be restrained for the damage done on both days, but only for that done on the latter. Further, a distress of things damage feasant, must be made whilst they are doing damage. The law therefore allows the distress to be made at night, and in short whenever they are so found on the land; for otherwise the cattle might escape. Nor does it matter to whom they belong—for they may be restrained damage feasant, although they may have come upon the land without the owner's knowledge or consent, or by default of another—provided that it be not by default of the owner of the soil, or of the tenant, as by not properly repairing the fences of the land, which by contract, prescription or law, he was bound to keep in repair; for in that case the distrainer cannot take advantage of his own wrong. But if the owner of the cattle suffer them to remain on the land after notice given him to remove them, they may be restrained for any damage done after such notice.

With respect to the disposal of the cattle, after they have been restrained damage feasant, the law has provided that they may be detained in a public or private pound till compensation be made for the distress. As to public pounds I know of none in Maryland, though such pounds are established in almost every parish in England; but Chancellor Kilty, in a note on the St. of 1 and 2 Ph. and M. ch. 12, says, "there is no alteration in the law, so as to prevent distresses from being impounded, yet it seldom if ever happens that they are so." Cattle damage feasant may therefore still be impounded in private pounds, which are either *overt* or *covert*—the former is a pound of which the sides are partly open, the latter is a complete enclosure as a barn or a stable.* Cattle ought to be put into a pound overt, so that the owner may see and have access to them for the purpose of feeding and tending them, which it is his duty to do. But if put into a pound covert, sustenance must be furnished them by the distrainer, who is not entitled to any satisfaction for the expense, and if they die for want of proper food and care, he must answer for them. In impounding cattle, no attempt must be made to confine them therein by such means as may injure them, for if a horse leaps over a pound and he is afterwards tied within it by a rope, with which he strangles himself, the distrainer is liable to make satisfaction.

When cattle are impounded in a private pound, notice of the place of such impounding must be given to the owner of them by the distrainer. But as the distrainer only holds the custody of the thing restrained, as a pledge for the satisfaction of the injury sustained, he cannot use or work it, although the owner may make what profit of it he can, while it remains in the pound. Every use of the thing restrained is considered as an abuse of it, so that such use cannot be justified, even by its being beneficial to the distress itself, and the distrainer is liable to an action for the recovery of damages therefor, under the statute of 11 Geo. 2, ch. 19, sec 19, which is applicable to and in force in Maryland. As the cattle so restrained cannot be sold, or in any manner converted to the use of the distrainer, under any circumstances, but must remain in the pound until reprieved by the owner, or satisfaction made for the damage done, it is apparent that this mode of redress must prove in many instances entirely nugatory and inefficient.

* So to use your own property, as not to injure another's.

On this head I shall only add to the exposition already made, that if a man come to distrain cattle damage feasant, and before the distress, a tender be made of sufficient amends for the damage, with costs, if any of the distress, the owner may immediately rescue his property from the hands of the distrainer—so also if a sufficient satisfaction is tendered for the damage done, together with the charges of the distress, after the distress, and before the impounding. But after the distress is taken and impounded, though without just cause, the owner cannot break the pound and take away the distress: if he does, the party distraining may have his action and retake the distress wherever he may find it.

The preceding view of the mode of redress granted to landholders, is too much in detail to furnish you with any entertainment, but I was reduced to the alternative of remaining silent, or of making such an exposition as would prevent misconception, and at the same time enable yourself and your friends to determine whether the provisions of our law were adequate or not, for the relief of the landed interest against trespassers. They appear to me, (if I may be permitted to express an opinion) to furnish a very inefficient remedy. In the first place it will be perceived, that though a distress damage feasant puts the owner of the cattle to inconvenience, and is therefore a punishment to him, yet if he continues obstinate and will make no satisfaction or payment, it is no remedy at all to the distrainer. Why should not the distrainer in this as a distress for rent, and other cases of distress, be permitted to sell the property distrained, after a certain period of notice to the owner, unless amends are made for the injury sustained? 2dly. There does not appear to be any provision in the law, how the amount of injury done by cattle damage feasant shall be ascertained, so as to authorise a delivery of the distress after tender being made of adequate satisfaction, or a rescue before the cattle is impounded and a replevin thereafter. 3dly. Why should not a landholder be permitted (which is not now the case) to distrain one out of many head of cattle, for the damage done by the whole herd, and also to distrain for damage done at several times by the same cattle as well as at the particular time, only where it is distrained? 4thly. In case of a rescue of cattle distrained damage feasant and impounded, or of a rescue before impounding, without lawful cause, should not the rescuer be subject to an indictment, as well as to an action for an unlawful rescue?

The only acts of the Legislature of Maryland, which relate to the subject of this letter, are the act of April, 1715, ch 31, and the supplementary act of 1769, ch. 8. The first section of the act of 1715, provides that all enclosures by fences or otherwise within the intention of that act, shall be five feet high. This section does not in any manner affect the law as before laid down on the subject of trespasses, nor is it to be construed to imply that unless a landholder has fences of that height he is incapable of supporting an action for trespasses committed on him by his neighbor's cattle. The height of five feet for a fence is prescribed only for the purposes and objects specified in that act. The same section provides that between the 1st May and 10th November yearly, and every year, all owners of any horse or horses, mares, colts and geldings, shall be obliged to keep up such horses, &c. within good and sufficient enclosures; and it is enacted in the next section, that if the owner of any such horses, &c. shall omit to keep them up, and such horses, &c. shall break into the enclosure of any inhabitant within the period above limited, and two warnings are given by the party grieved to the owner, who neglects to keep them up, it shall be lawful for the party grieved to shoot, kill or destroy any such horse, &c. provided it be done on his enclosed grounds. The 4th sec. of this act, as well as the act of 1769, relates to the manner of taking up estrays, the owners of which are unknown. The 12th sec. of the first act provides that all stoned horses shall be kept within good sufficient enclosures, and that if any such (that have been taken and broke fit for use) shall happen to be found at large, it shall be lawful to take up and impound the same in some open

pound, and there to detain him until the owner shall satisfy the person so impounding, the sum of *five shillings or 60 lbs. of tobacco*. By the 13th section any stoned horse above 13 months old, unbroke, which shall be found loose in the woods, may be shot, and by the 14th section it is not lawful for any person not having lands of his own, nor renting a plantation, to keep breeding mares in the woods, under the penalty of *50 lbs. of tobacco*. The three last sections were intended to restrain the increase of useless horses the multitude of which had become burthensome and pernicious to the state, at its early settlement. The other sections afford little protection against trespasses. It is little satisfaction and is no compensation for an injury, to have the privilege of shooting your neighbor's horse, and the legal exercise of that privilege, injures the community by diminishing the capital employed in agriculture. It may also be remarked with respect to the efficacy of the act of 1715, that it is as necessary that hogs and neat cattle should be kept up within good and sufficient enclosures during certain periods of the year, as horses.

Immediately connected with your enquiry, is an act of assembly passed in the year 1813, to prevent the unlawful cutting and carrying away of wood and timber. It gives jurisdiction to a justice of the peace, where the damage does not exceed fifty dollars to try and determine the matter in controversy, between the owner of the land and the trespasser, and if he is satisfied that the wood cut, destroyed or carried away, belonged to the plaintiff, to give judgment in his favor, against such trespasser, for such damages, as may be assessed by any two or three judicious freeholders, to be appointed by the justice trying the case. But if the justice should be satisfied that the plaintiff is not the rightful owner of the wood or timber, which has been trespassed on, judgment must be given in favor of the defendant for costs, and in case the alleged trespasser shall claim title to the land on which timber or wood was growing or lying, or allege that he acted under any person claiming title to such land, and verify such claim or justification by his oath or affirmation, the justice shall take no further cognizance of the complaint. The summary nature of the redress prescribed by this act, renders it salutary in its operations. It might however, be advantageously extended to other descriptions of trespass, and its efficacy would be enhanced by authorizing the justice of the peace on full proof of the trespass, to give judgment for double damages against the defendant.

From the hasty view I thus have taken of the law on the points of your inquiry, I think it must be apparent that sufficient protection has not been given to the interest of the landholder in this state; that much might be done by judicious legislation, which while it secured to the cultivator the enjoyment of the expected and deserved harvest, would only punish the wilful and flagitious trespasser without oppressing any class of the community. The deficiency of timber, and the expense and difficulty of making and repairing fences, are now so sensibly felt throughout the country, that the passage of some more operative law to defend them, seems to be generally admitted. It is equally necessary to restrain more effectually trespasses by cattle; nor is it any just objection to this position to urge that the laws which we have derived from England have been hitherto found sufficient for that purpose by our ancestors. It should be recollect that there are many means in England to punish a troublesome and poor trespasser besides an action at law, although that of itself from the enormity of the expenses of litigation in that country is enough to frighten those who with some property depend principally on their labour for support. But the liberality of our free constitutions do not permit a virtual denial of justice by exposing a litigant to ruin, nor will they clothe our magistrates with the unlimited discretion allowed by the British vagrant and poor laws, nor suffer a press-gang to sweep out of our community at the beck of a lord of the manor, without a trial, any poacher or trespasser, however guilty. Such remedies would be worse than the disease. Every grievance to which the agriculturist is subject, may be cured under our republican

institutions, without infringing the liberty of the citizen. It only requires that due zeal and reflection should be exercised by the state legislature on this subject. In the course of this communication I have endeavored to point out some of the defects of our laws, and many more will suggest themselves to yourself and others of more practical experience.

Excuse this long letter, and believe me,
Dear Sir, your obedient Servant,

JOHN LAW.

P. S.—At the next meeting of the Agricultural Society, I propose to make a communication on the art of ornamenting country residences with economy, and of laying out grounds surrounding the owner's house, a subject very interesting, but hitherto little attended to in Prince George's county.

For the American Farmer. CUT WORM.

MR. SKINNER—Having suffered severely in the corn crop, for several years past, and particularly during the last year, by the ravages of the cut worm, I determined to try the effect of a fall-fallow for a crop of corn for the present year, in destroying the worm, it being a pretty generally received opinion, that a fall-fallow by exposing the worm, to the winter's frost, would destroy it. For this purpose, the whole of a field of 110 acres, covered with a heavy clover stubble, was well and deeply ploughed last fall, chiefly with oxen, two yoke to a plough, except about fifteen acres, which for experiment were left unbroken. Ten of the fifteen acres, were sown this spring, at the usual time, with four furrows of a two horse plough, and in horizontal rows of six feet distant, leaving the interval between the lists, called in our agricultural phraseology, the baulk, unbroken, and well set with clover, left as food for the worms, and so far, as a protection to the corn. The other five acres, remained undisturbed, and out of cultivation. The whole field thus prepared, with the exception of the above five acres, was planted in corn, about the middle of the last month (April.) The worms commenced their depredations, with the coming up of the corn. A large proportion of the corn in that part of the field, fallowed last fall, has been destroyed by the worm, and the remainder, so crippled, as to render it doubtful, whether it can be depended on for a crop. It has however, been re-planted, with the hoe alone, at the expense of considerable time and labour. The corn in the ten acres of the baulk land, together with the clover in the baulks, has been destroyed literally root and branch, and the five acres of clover adjoining has shared the same fate. I have never seen an instance, of so entire and complete a destruction of every species of vegetation, by the worm. The roots of the clover are eaten into shreds, and with those of the corn and all other vegetation, completely annihilated. I have on this day (22d May) re-ploughed, and re-planted the whole piece, with however but little hope, of succeeding in a crop from it, for the worms are still as numerous as ever, with increased powers of doing mischief.

While these ravages have been sustained on a clover fallow, twenty acres of low grounds, in wheat the last year, and planted in corn this spring, have remained perfectly free from the worm. Now it is to solicit information as to this fact, among your numerous correspondents,

that I have troubled you with the foregoing details. If it can be satisfactorily ascertained that, corn following wheat, will be exempt from the worm, it is an important fact, and one which should be generally known. An opinion to this effect, I know, pretty generally prevails, but has not been established upon any satisfactory data, so far as comes within my knowledge.—Many no doubt of your numerous readers, and correspondents, have pursued a rotation of crops, which will bring the fact, to a satisfactory test. Heretofore, mine, has been a six years rotation of crops, in the following order:—corn; wheat; clover; wheat; clover; and clover. Under this system, with the two auxiliaries gypsum and manure, the land has rapidly improved. But for several years past, owing to the depredations of the worm, the labour expended in the corn crop (to say nothing of the risque of a total failure) has been so greatly increased, as to render it out of all proportion to the value of the crop, when made. An abandonment therefore of the corn crop, or a change of system, which will free us from these troublesome attendants of the clover, has become indispensably necessary. I propose to try a change of system and to make corn follow wheat. This will throw the three grain crops together in succession, a course which none but strong lands, will sustain. In the meantime, I should be gratified, to receive, through the medium of your valuable miscellany, any suggestions as to a better system of crops, or further information, as to the facts above mentioned.

Respectfully your most obedient,
DABNEY MINOR.

Orange, May 22, 1821.

*MEANS OF KNOWING THE PRECISE MOMENT
OF THE EQUINOX.*

There are few almanacks that do not notice the equinox, and it is rarely they agree. This sometimes embarrasses those, who for some operation, await this instant to which so many virtues ("tant de virtus") are attributed.

The following are the means founded on experience:

The secret consists in having the ashes of vine branches, and a chrystral glass. The glass must be clear, and the ashes well sifted. The glass should be placed on a solid table, or something not liable to be agitated, the windows and doors exactly closed, that the wind may not disturb the operation. These dispositions being made, fill the glass with clear water, and throw in about two spoonfulls of the ashes, which will soon be precipitated to the bottom, and leave the water transparent. You then wait with patience the moment of the equinox.

At the moment the sun ascends to our hemisphere, or decends from it, the ashes will rise from the bottom of the glass, and render the water turbid, as though an invisible hand had shaken it.

This experiment, as curious as easy, offers to philosophers a great subject of meditation, and those of them who may assure themselves of its truth, will, in accounting for it, draw forth principles more luminous and fruitful in useful knowledge, than the analogy of the electrical fire with that of thunder.

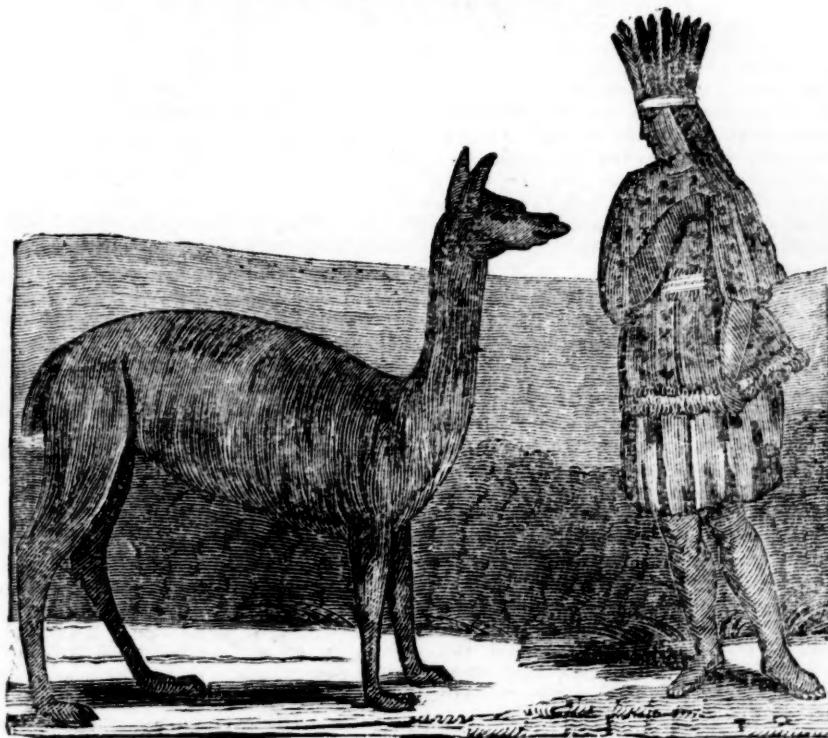
J. S.

THE SHEEP OF PERU

Are exceedingly valuable, and ought to be introduced into the U. STATES OF NORTH AMERICA.

(Continued from page 84, No. 11.)

THE HUANACO.



The Huancaco is rather smaller than the Alpaca, of course less than the Llama—its general stature is about three and a half feet high. That it can be domesticated when taken as a suckling, has been proved in several instances and that it will intermix with the Alpaca, the Llama, and the common European sheep, has likewise been proved by various experiments.

That the Huancaco as well as the Vicuna have generally remained in a wild state, has arisen from the inattention of the Spanish government, and from the Indians having a superabundance of the Alpaca and Llama for all domestic purposes.

At the time of the expulsion of the Jesuits from South America, they had upwards of a thousand of Huancacos and Vicunas in a tame state in their inclosures—they had crossed the breed with the other species of sheep, and saw

the importance of the scheme both for the country, as well as Europe, but after the departure of the Jesuits, the plan of domesticating the two wild species was abandoned, and it has not since been renewed.

It has been found that the Huancaco, though of a deep bay colour, crossing with a white female Llama, produces an offspring nearly of the hue of the mother—and in the second generation, besides being perfectly white, the wool has been considerably improved in fineness.

The Huancaco is the swiftest animal of Peru, and is more courageous than either of the other species of sheep; and although, as regards his wool, he is of less value than the others, yet it is probable that great advantages may be derived by crossing with this breed, and therefore it is desirable to introduce this species as well as the others, into the U. States.

(TO BE CONTINUED.)

For the American Farmer.

MELONS,

How to protect them from the depredations of Bugs.

MR. SKINNER—

You requested your subscribers to send you some cantelope seed, and although I have neglected a prompt compliance, I hope those which I now send to you, will be in good time. The seed marked No. 1, were taken from two of the finest melons which I tasted last summer. I dried them myself, and have kept them distinct from any other seed, in order to ascertain whether the seeds of a single cantelope will not produce a variety of melons. I have sometimes

had reason to believe it would, but have never ascertained it. The note I find on the paper enclosing the seed, is, *those are seeds from two large sized cantelopes, exactly similar, rough sage coloured skin and flesh, almost white at the inside.* I wish you to plant them separate from any others, to ascertain whether they will produce fruit answering the above description. No. 2, is mixed seed, which you may find very good. I generally have cantelopes very fine, and in great abundance. I have been very much injured by a small striped yellow bug, and have unsuccessfully applied lime, soot, brimstone, plaster, and even Scotch snuff, to destroy them. If the upper surface of the leaf was covered, they would depredate on the under part, or the stem, and one season when they ap-

peared late, and destroyed plants which I thought were out of danger—I almost failed in my crop, it was too late to replant, but I have adopted a method which completely succeeds. I have generally plenty of seed, and after I begin to plant, I have fresh seed stuck in the hills every week, until the beginning of June, paying no respect to the state of the plants on the hills. When the bugs make their appearance, I make a little boy examine the hills every morning, and if they are numerous, several times through the day, and kill all he can. In the morning, if cool, they are easily caught, but in the heat of the day, they are very lively. They are much disposed to congregate, and if not checked on their first appearance, they increase very rapidly; it is frequently necessary to destroy all the plants on a hill, when they are very numerous there, and I do this the more willingly, knowing there are seeds in the ground to succeed them. I have recommended this practice to others, who have also succeeded. If there are two many plants in the hills when the insect is destroyed, they can be thinned to any number which may be thought sufficient.

A.

ON PEA HAY.

By Thomas Pinckney, Junior, Esq.

ALTAMONT, Sept. 9, 1816.

DEAR SIR—A committee of this Society was appointed during the last year, and charged to discover and recommend some mode of maintaining farm stock, besides the incessant application to the corn crib. This committee among other substitutes and aid, recommended pea hay, as affording a rich food for horses and cattle, and whose culture at the same time, was easy, and its growth beneficial to the soil. Believing the recommendation to be judicious, I have adopted it, and now take the liberty of submitting to the Society the result of my first crop of pea hay.

The last of April I ploughed up an old field which had been in corn the preceding year, a stiff red clay much worn, and of which about two acres had been manured for corn, the preceding year. Across this ploughing I drilled in peas with a shovel plough, three feet apart, on the 6th and 7th of May. I ploughed them twice; the first time between the 1st and 3d of June; the second time between the 20th and 24th June; I hoed them once, the end of June. This is all the culture they received. On the 26th of Aug. I began to cut the pea vines, and finished the 27th, cutting half the field, which consists of 14 acres. In most places the dry weather had injured them, and they did not look as flourishing as I expected. Four days after cutting them, I turned them; putting two rows into one, and on the sixth day I turned them again. On the morning of the 8th day, I began to haul them in, and finished the next day; and they have produced me twenty-five heavy wagon loads of rich, good fodder. As this produce may be best understood by comparison, I will state that I had a field of corn of twenty-two acres adjoining, of new land, only the second crop, which had been planted very early, and had not suffered by the drought; the fodder was very good, and was carefully saved, and produced me sixteen wagon loads.

I am extremely sorry I have not the means of weighing a load of the pea fodder, but I should think a wagon load of it must weigh nearly twice as much as a load of corn blades, and the difference in quality is very great. Twenty-five loads from seven acres and a half in one case, and sixteen loads from twenty-two acres in the other. Less than two-thirds of a load of blades to the acre, and more than three loads of pea fodder to the acre.

If it be true, as has been stated to me, from the best authority, that a peck basket of these vines, chopped in a common cutting box, twice a day, is good and sufficient food for a horse, with a small portion of blades, when not at hard work: I should not hesitate to believe this produce to be superior to that of a regular corn crop, on such land, which could not be expected to produce much more than ten bushels to the acre. Indeed I know positively from

my memorandum book, that its produce last year, under favorable circumstances, was but ten bushels and a half. At this rate my seven acres and a half would produce me but seventy eight bushels of corn, and about five wagon loads of fodder. Let us suppose a heavy load of this fodder to be equal to seven bushels of corn, (and I would not exchange it for ten,) these seven acres and a half have produced me that which is equal to 175 bushels of corn, in feeding cattle and horses; and I know it would puzzle the best farmer to produce half this quantity from these seven acres and a half, in their present state. If to these advantages we add that peas are an ameliorating crop, drawing very little from the earth, and shading and protecting it from the powerful influence of the sun, that their leaves are mostly left on the soil, to enrich it, and that they are a fine preparatory crop for wheat, as they may be got off the land exactly in time to prepare it for seeding, I think that we shall agree that the committee have been very judicious in recommending the pea culture; and I hope my success will induce some of my brother farmers, who have fields requiring rest or shift, to substitute a crop of peas for the common mode of sowing oats or wheat which are exhausting crops.

The Society will readily perceive the error I committed in this crop: the peas were sown, as I have stated, on the 6th and 7th days of May, when they ought to have been sown as early as the frost would permit. This circumstance and the late dry weather evidently injured them very much.

I am, dear sir, very respectfully,
Your obedient humble servant.

THOMAS PINCKNEY, Jr.
J. T. LEWIS, Esq. Corres. Sec'y. of the Pendleton Farmer's Society, South Carolina.

BENE PLANT.

Directions for Cultivating it, with remarks on its great produce of Seed, yielding a good SWEET-OIL abundantly.

ANNAPOLIS, May 26, 1821.

SIR—As General Foreman has attempted to introduce the Bene Plant into this state, I send you below a copy of a letter from Mr. John Morel to Mr. Charles Thompson, secretary of the Philosophical Society, at Philadelphia, dated Savannah, May 5, 1769. A republication of which at this time may be useful.

Yours &c.
J. S. SKINNER, Esq.

MR. JOHN MOREL TO MR. CHARLES THOMPSON.
SIR—I send you a small keg of bene, or bene-seed, which you will please present to your society for their inspection. This seed makes oil equal in quality to Florence, and some say preferable. Some say one hundred weight of seed will produce ninety pounds of oil, others say less; be that as it will, it certainly makes very fine oil, and produces amazingly. If it is put to the trial, care should be taken to have the press well cleaned, so as to leave no tincture from what may have been already pressed: in my opinion, this is an article of consequence, and I believe it will grow in Philadelphia. The way to sow it is in holes about three feet asunder, dropping in each hole about ten grains; when it comes up, thin it to three or four of the most promising:—the seeds will appear in pods about September, and should when full grown, and before dry, be gathered in. The method is as follows: As soon as you perceive about three fourths, or four fifths, of the pods rise on the stalk, and the lower pods begin to loose their seeds, it is then time to take it in; for after that, as much will fall out of the bottom pods each day as can ripen at the top. You take a sharp hatchet-hill, or some such weapon, and with it cut off the stock twelve or eighteen inches below any of the seed, holding the stock with the left hand, and when cut a second person receives it, keeping it upright, till he has his load; for if you turn it downwards, the ripe seed will fall out of the pods. You may immediately carry it into a

barn, and set it upright on a close floor, till you perceive all the pods are fully dry and open; (you may, if you choose, leave it in the field, which must be the case, if a large quantity is planted,) then thresh it, and run it through a proper sieve, and it is fit for use.

We are quite unacquainted with the method of expressing the oil, but we believe if it is designed for table use, nothing should be done to the seed, as it might give it an ill-taste. The lighter and drier the soil is, in which it is planted, the better.

THE FARMER.

BALTIMORE, FRIDAY, JUNE 15, 1821.

We shall, in our next Number, have the pleasure to give a detailed official account of the Cattle Show and Fair held by the Maryland Agricultural Society, on the 7th and 8th days of June; until when we are compelled to delay it by the unavoidable absence of the secretary, John E. Howard, Jr. Esq. from this city.

PRICES CURRENT.

Flour from the wagons, \$4 12½—Whiskey from do. 27cents, including barrel—Hay, per ton, \$18 a 20—Straw, do. 7 a 8½—Wheat, White, 83 cents—Red, do. 80—Corn, White, 31 a 32—Yellow, 32 a 34—Oats, 23 a 24—Rye, 40—Cod fish, per quintal, whole sale, \$3, retail do. \$4—New-England Beans per bushel, \$1 12½—ditto Peas, 75 cents—Plaster in stone \$6 per ton—do, ground, \$1 25 per barrel, 33 cts. per bushel, \$8 per ton—New-Orleans sugar, \$9 to 12 50—Muscovado, do. \$9 a 12—American White Lead, \$12 50—Ground do. 13 a 14—Linseed Oil, 75 cents—Feathers, 40 a 45 cents—Potatoes, per bushel, 62½ a 75 cents—Shad, new, \$6—Herrings, \$2 a \$2 25, declining—Fine Salt, 55 cents per bushel—Ground Allum do 55 a 60—St Ubes, 60—Cadiz, 50 a 55—Turks Island, 75—Live Cattle, \$5 a 5 50—Beef, 8 to 10 cents—Hams, 10 a 12 cents—Middlings, 10 cents—Butter, 25 cents—Peas 50 cents per bushel—Strawberries, per quart, 8 cents—Cherries 10 to 12 cents—Eggs, 12½ cents—Cheese 8 a 10 cents per pound—Tar \$1 50—Turpentine, 1 87½ a 2—Pitch 2½—Rosin, common, \$1 12½, bright do. \$3 per barrel—Varnish, 25 cents—Spirits Turpentine, 32 cents per gallon—Cotton, (good Upland) 14 a 15 cents; very dull—Rice 3 a 3½ cents—Ship and Flooring Plank, \$25 a 27—shingles, best 64 a \$7, common, \$3 to 4½ per M.

Maryland Tobacco.—Lower counties, common, from 3 dolls. 50 cents to 6 dolls. 50 cents, large sales; fine, no sales—Virginia Tobacco no sales.

STRAW CUTTER, &c.

The subscriber has just completed and has for sale, a quantity of

Hyde's Straw Cutting Machines.

They are made of the best materials, and combine simplicity, economy, durability, and labour saving; they can be applied to horse, steam or water power; also, to cut corn stalks, hay, clover, &c. from half an inch to two inches; the principal knife is permanent; the axle or cylinder contains three pressures, which act as a shears; it feeds itself by rollers, and works by spur wheels; every revolution of the balance wheel cuts three times. He challenges any state or individual in the union, to come forward and prove their equal.

He has also for sale, a quantity of BOX CHURNS of sizes, which will make butter in a short time. A liberal discount will be allowed to retailers, in town or country. Any commands left at CASEY'S SEED STORE, No. 2, Hanover-street, next door to Barnum's Hotel, at the work shop, opposite, or at Sutliff's Livery Stables near the Marsh market, will be attended to.

JOHN GILL

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